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G11B H03J H04N

(54) **Video cassette recorder programming via teletext transmissions**

(57) A system for video cassette recorder programming using existing television broadcast teletext transmissions. The programmes required are chosen from schedules displayed on teletext pages, the necessary control information is loaded automatically into a VCR, and programme labels are transmitted to ensure that the correct programmes will be recorded even if programme timings are altered. All the transmitted signals for achieving the above are fitted into the coding structure of a teletext transmission.
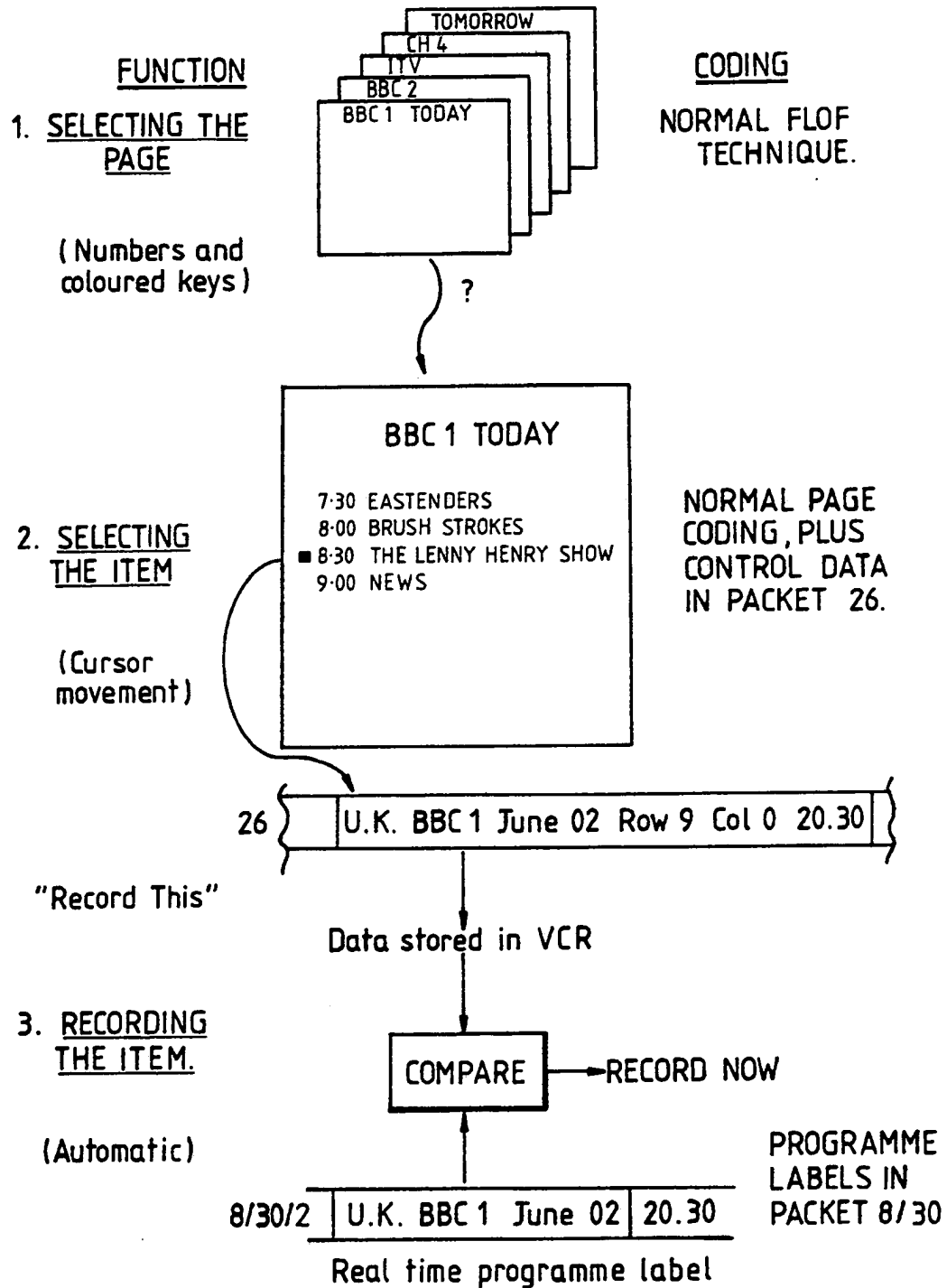
*Fig.1.*
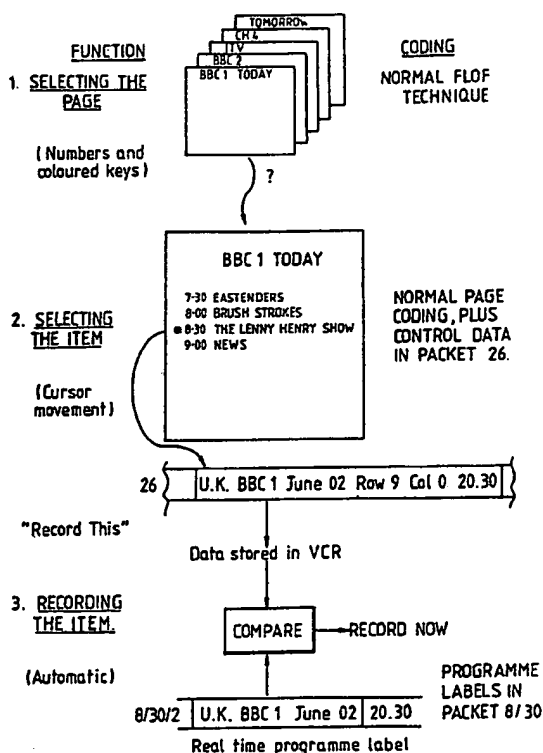


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The drawing(s) originally filed was (were) informal and the print here reproduced is taken from a later filed formal copy.
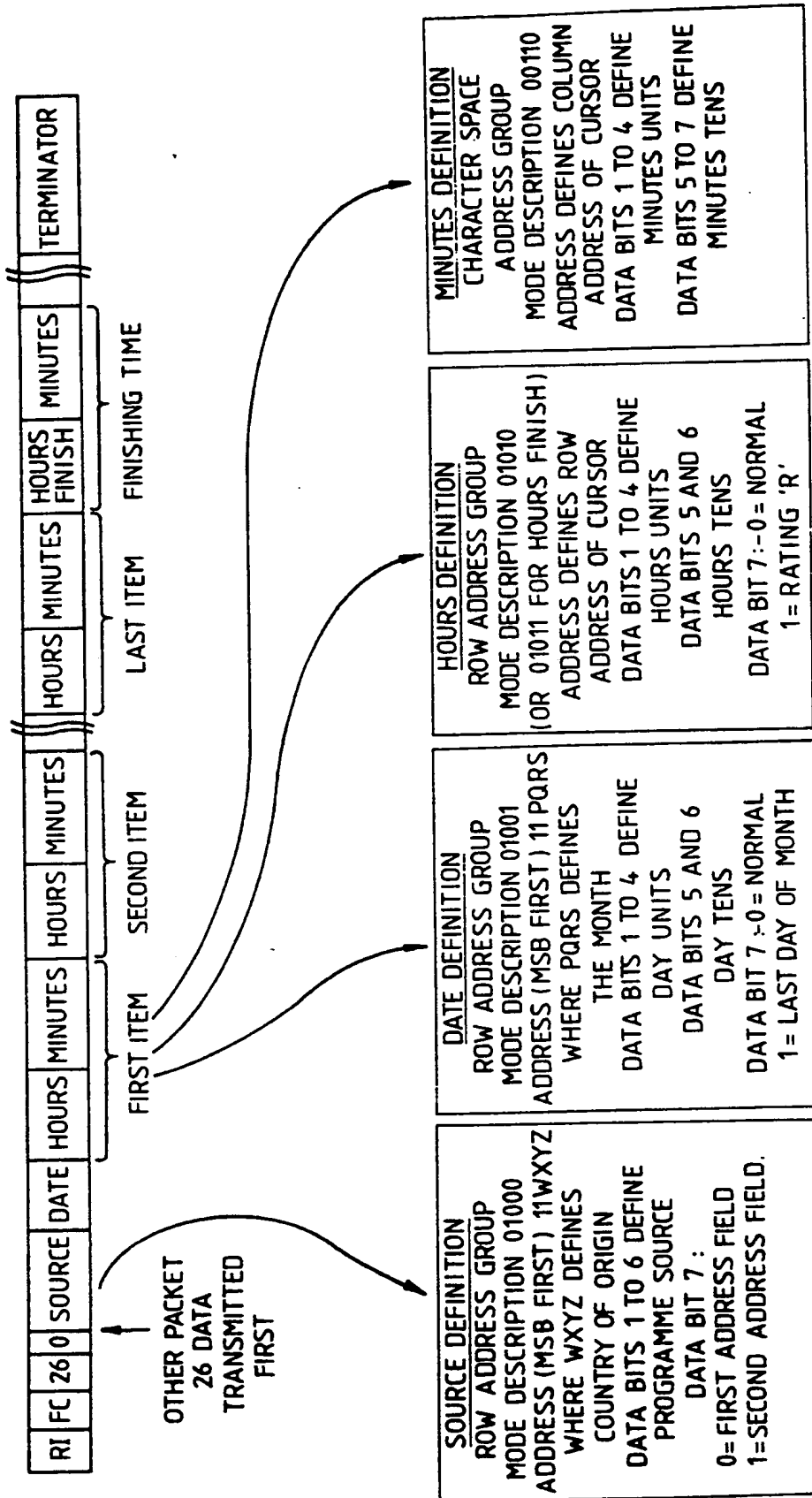
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## Fig.1.

| FUNCTION | | CODING |
|---|---|---|
| 1. SELECTING THE PAGE | | NORMAL FLOF TECHNIQUE. |

( Numbers and coloured keys )

```
                    TOMORROW
                  CH 4
                ITV
              BBC 2
            BBC 1   TODAY
```

?

BBC 1 TODAY

7·30  EASTENDERS
8·00  BRUSH STROKES
■ 8·30  THE LENNY HENRY SHOW
9·00  NEWS

2. SELECTING THE ITEM

(Cursor movement)

NORMAL PAGE CODING, PLUS CONTROL DATA IN PACKET 26.

26 ⟩ | U.K. BBC 1 June 02 Row 9 Col 0 20.30 | ⟩

"Record This"

Data stored in VCR

3. RECORDING THE ITEM.

(Automatic)

| COMPARE | ──▶RECORD NOW |

PROGRAMME LABELS IN PACKET 8/30

8/30/2 | U.K. BBC 1 June 02 | 20.30

Real time programme label

Fig.2.

**SOURCE DEFINITION**
ROW ADDRESS GROUP
MODE DESCRIPTION 01000
ADDRESS (MSB FIRST) 11WXYZ
WHERE WXYZ DEFINES
COUNTRY OF ORIGIN
DATA BITS 1 TO 6 DEFINE
PROGRAMME SOURCE
DATA BIT 7:-
0= FIRST ADDRESS FIELD
1=SECOND ADDRESS FIELD.

**DATE DEFINITION**
ROW ADDRESS GROUP
MODE DESCRIPTION 01001
ADDRESS (MSB FIRST) 11 PQRS
WHERE PQRS DEFINES
THE MONTH
DATA BITS 1 TO 4 DEFINE
DAY UNITS
DATA BITS 5 AND 6
DAY TENS
DATA BIT 7:-0= NORMAL
1= LAST DAY OF MONTH

**HOURS DEFINITION**
ROW ADDRESS GROUP
MODE DESCRIPTION 01010
(OR 01011 FOR HOURS FINISH)
ADDRESS DEFINES ROW
ADDRESS OF CURSOR
DATA BITS 1 TO 4 DEFINE
HOURS UNITS
DATA BITS 5 AND 6
HOURS TENS
DATA BIT 7:-0 = NORMAL
1= RATING 'R'

**MINUTES DEFINITION**
CHARACTER SPACE
ADDRESS GROUP
MODE DESCRIPTION 00110
ADDRESS DEFINES COLUMN
ADDRESS OF CURSOR
DATA BITS 1 TO 4 DEFINE
MINUTES UNITS
DATA BITS 5 TO 7 DEFINE
MINUTES TENS

DESCRIPTION:

### VIDEO CASSETTE RECORDER PROGRAMMING VIA TELETEXT TRANSMISSIONS

This invention relates to a system for video cassette recorder (VCR) programming using existing television broadcast teletext transmissions.

It is an object of the invention to simplify the control of domestic VCRs to record desired television programmes on tape.

A VCR programming system used in Germany and known as the VPS system employs a "real-time" schedule which is transmitted by a broadcaster in a 2.5 Mb/s data stream. This system requires manually programming of a VCR by a user. An automatic VCR programming system which is at the experimental stage in Germany and is known as the VPV system provides control information on a teletext page for programming a VCR.

The general principles underlying the present invention are conform to these German VPS and VPV systems, in that the programmes required are chosen from schedules displayed on teletext pages, the necessary control information is loaded automatically into a VCR, and programme labels are transmitted to ensure that the correct programmes will be recorded even if programme timings are altered.

However, in accordance with the present invention all the transmitted signals are fitted into the coding structure of a teletext transmission. This allows maximum economy in the receiving equipment in that normal teletext decoder hardware can be used. Also, an efficient use is made of transmission capacity, and operation is simple. Furthermore, complete editorial freedom in the creation of teletext pages is maintained.

For simpler user-programmed VCRs, a video programming teletext (VPT) system embodying the invention allows functional compatibility with the German VPS system; i.e. a VCR can be designed to work off VPV or VPT transmissions with no difference to a user.

The invention also includes transmission means for producing

such transmitted signals and receiver means which are responsive thereto.

In carrying the invention into effect, it is envisaged that a VCR will be equipped with its own teletext decoder, as well as the normal receiving circuits. Alternatively, a teletext television receiver could provide a suitable control interface to the VCR. In either case, a user would select teletext in conventional fashion and choose pages giving details of television programmes.

On deciding to record a particular programme, the user causes a cursor to appear on the screen by pressing a cursor button on the remote control unit. Further pressing of this button causes the cursor to move automatically to each next programme displayed on the page, until it reaches the desired programme. Subsequent pressing of a 'record this' button loads the corresponding information (programme source, date, time label) into the VCR programming circuits automatically. The programming information is invisible to the user, who simply chooses the programme from the list presented on the screen.

The VCR programming circuits then look for a broadcast label matching the downloaded information, and when there is a match (not necessarily at the previously intended time) the recording process is set in motion. In this way the selected programme is recorded on tape in a simple and efficient manner. The detailed methods of control would be a matter for individual VCR manufacturers.

Three types of coding are important for the coding of the necessary transmitted information, within the teletext coding structure, for the VPT system. Firstly, the way in which teletext pages are selected to ease a user's task, considering that several programmes may be chosen for days or even weeks ahead. This inevitably means a substantial number of teletext pages. Secondly, information must be coded for a given page to indicate the positions on the screen appropriate for the cursor, and to associate with each cursor position control data relevant

to the corresponding programme. Finally, the transmission of programme labels at the time programmes are broadcast must be considered.

The necessary VPT functions are summarised in Figure 1 of the accompanying drawings.

As regards transmission coding, page selection can be effected using the normal FLOF/Fastext system (see 'User Friendly Page Access (FLOF) Code of Practice', which is an Appendix to the World System Teletext Technical Specification published by the Department of Trade and Industry). No extra facilities are needed. The use of the sub-code page linking feature to 'freeze' rotating pages may be appropriate in many cases.

As regards programme coding, the display of a programme schedule on a teletext page can be done with full editorial freedom. For example, a page giving programmes some days ahead might control a simple list of perhaps 16 programmes with titles and starting times. Conversely, a page might refer to just one programme, e.g. a film, with detailed background information. Normal page coding (including the status row for FLOF prompts) applies to the displayed information.

The editor has to decide how many titles of recordable programmes there are on the page, and allocate to each one a location on the screen (row and column) where it would be reasonable to place a cursor to refer to the title. The cursor position should precede the programme title on the same row, to allow it to be used for reference.

Coding information for the corresponding programme is allocated to each designated cursor position, programme source, date and nominal starting time. All this data is coded into packet 26 using previously unallocated code combinations. This technique allows commonality of decoder hardware and software, as most future teletext decoders will also use packet 26 to obtain an extended language capability.

The VPT coding technique is shown in Figure 2 of the accompanying drawings.

Four types of packet 26 groups ('triplets') are used to define programme control data. They are, respectively, Source Definition, Date Definition, Hours Definition and Minutes Definition.

It is envisaged that the VPT packet groups would follow in the transmission order the transmission of any packet groups used for display or character set enhancement. All VPT data would be together and not interleaved with other functions. On completion of VPT data the normal termination rules would apply.

In general, a teletext page will contain programme titles for programmes from only one source on one date. The Source Definition and Date Definition groups should be transmitted first, but only one transmission per page is required. In contrast, a pair of Hours Definition and Minutes Definition groups must be transmitted for each programme title displayed. These pairs should be transmitted in the order of the cursor positions to which they refer (left to right and top to bottom).

If the Source or Date of a programme is different from its predecessor, a Source Definition or Date Definition group must be inserted as appropriate before the corresponding pair of Hours Definition and Minutes Definition groups. For each displayed programme title, the decoder uses the latest defined Source or Date values.

The Source Definition group is a packet 26 row address group with the mode description code set to 0100. It defines the source of the programme to which it refers, the country of origin and the transmitter network. The coding of this group does not address any particular location on the display, but is associated with a cursor location by virtue of its position in the transmission sequence as indicated above. Address values (decimal) of 48 to 63 define country of origin. The two most significant address bits define the country of origin as in the German VPS specification. Data bits 1 to 6 define the programme source in the same way as in the German VPS specification. Different programme source codes may apply to the same television

channel at the receiver, for example to distinguish between
national and regional programmes. The broadcaster should label
local programme variations with the correct local source code, so
that no ambiguity in recording can arise. It is up to each
receiver to indicate to the user whether it is capable of
receiving programmes from a particular source. Data bit 7
defines the address field, 0 giving the first address field and 1
the second address field. Effectively, this allows up to 128
programme sources to be defined per country.

The Date Definition group is a packet 26 row address group
with the mode description code set to 01001. It defines the
calender date of the programme to which it refers. The coding of
this group does not address any particular location on the
display, but it is associated with a cursor location by virtue of
its position in the transmission sequence as indicated above.
Address values (decimal) of 49-60 define the month, 49 being
Janury and 60 being December. The four least significant address
bits are thus coded in the same way as the German VPS system.
Data bits 1 to 4 define the units digit of the day, in binary
coded decimal form, with bit 1 the least significant bit. Data
bits 5 and 6 define the tens digit of the day, with bit 5 the
least significant bit. Data bit 7 is normally 0, but is set to 1
to indicate that the last day of the month is defined. This
allows the decoding equipment a simple method of calculating the
following date.

The Hours Definition group is a packet 26 row address group
with the mode description code set to 01010. It defines the
'hours' element of the VPT programme starting time, and is always
the first of a pair of Hours and Minutes Definition groups.
Address values (decimal) of 40-63 define the row address of the
cursor position required. Values 41 to 63 define rows 1 to 23
and value 40 defines row 24 in conventional fashion. Cursors
cannot be located in the page header, row 0. Data bits 1 to 4
define the units digit of the hour, in binary coded decimal form,
with bit 1 the least significant bit. Data bits 5 and 6 define

the tens digit of the hour, with bit 5 the least significant
bit. Hours tens values of 0,1 and 2 are valid as normal, and
value 3 is also defined as valid. When value 3 is set, it
implies that the hours tens are set to 0 but the date is
5    incremented by one from that indicated in the Date Definition
group. This allows programmes starting after midnight to have
the correct calender date assigned in compatibility with the
German VPS specification without the need to transmit a second
Date Definition group on the same page. The month is incremented
10   and the day reset to 1 if bit 7 of the Date Definition group is
set to 1 indicating the last day of the month. Data bit 7 is
normally 0, but may be set to 1 to indicate 'not recommended for
young people' (rating 'R' of the German VPS specification). This
allows the decoding equipment to generate a suitable status
15   message or control if required.

      The Minutes Definition group is a packet 26 character space
address group with the mode description code set to 00110. It
defines the 'minutes' element of the VPT programme starting time,
and is always the second of a pair of Hours and Minutes
20   Definition groups. Address values (decimal) of 0 to 39 define
the column address of the cursor position required, in
conventional fashion. Data bits 1 to 4 define the units digit of
the minute, in binary coded decimal form, with bit 1 the least
significant bit. Data bits 5 to 7 define the tens digit of the
25   minute, with bit 5 the least significant bit.

      There is also a VPT Hours Finish group which is a packet 26
row address group with the mode description code set to 01011.
It is used in the same way as the Hours Definition group, in a
pair with a Minutes Definition group, but defines the finishing
30   time of the preceding programme referred to on the page. Display
of the finishing time is optional at the editor's discretion.
The VPT finish pair allows the equipment to calculate the amount
of tape required to record the last item on a page. It should
also be used within a page where the finishing time of a
35   programme is different from the starting time of the next

programme.

The assignment of VPT data to a teletext page requires the transmission of additional information in packet 26, as indicated above. However, the overhead is quite small, and each page only requires sufficient packets 26 to deal with the number of programmes decided by the editor. Assuming a VPT page refers to only one source on one date 5 + 2N triplets are required where N is the number of VPT programmes. Each packet 26 contains thirteen triplets; the capacity of the technique is tabulated below.

| No. of packets | No. of VPT programmes | Transmission overhead |
|---|---|---|
| 1 | 4 | 4% |
| 2 | 10 | 8% |
| 3 | 17 | 11% |
| 4 | 23 | 15% |
| 5 | 30 | 19% |
| 6 | 36 | 23% |

With present editorial techniques a typical programme schedule page contains less the 17 programme titles. This could have VPT data assigned in 3 packets 26 with a transmission overhead of approximately 11%. As the VPT pages would probably be a small proportion of a teletext service, the overall transmission overhead (in terms of increased access time or reduced number of pages) is small.

The programme labels at the time of transmission are sent in packet 8/30 format 2. (See section 13.3 of the WST specification). Coding of this data corresponds to that in the German VPS specification.

From reading the present disclosure, other modifications will be apparent to persons skilled in the art. Such modifications may involve other features which are already known per se and which may be used instead of or in addition to features already described herein. Although claims have been formulated in this application to particular combinations of

features, it should be understood that the scope of the
disclosure of the present application also includes any novel
feature or any novel combination of features disclosed herein
either explicitly or implicitly or any generalisation or
modification thereof which would be apparent to persons skilled
in the art, whether or not it relates to the same invention as
presently claimed in any claim and whether or not it mitigates
any or all of the same technical problems as does the present
invention. The applicants hereby reserve the right to formulate
new claims to such features and/or combinations of such features
during the prosecution of the present application or of any
further application derived thereform.

CLAIMS:

1.    A system for video cassette recorder programming using
existing television broadcast teletext transmissions, wherein
programmes required are chosen from schedules displayed on
teletext pages, the necessary control information is loaded
automatically into a video cassette recorder, and programme
labels are transmitted to ensure that the correct programmes will
be recorded even if programme timings are altered, characterised
in that all the transmitted signals are fitted into the coding
structure of a teletext transmission.

2.    A system as claimed in Claim 1 for use with a teletext
transmission comprising pages composed of display row data and
non-displayed control row data, characterised in that the
display row data of a page defines a plurality of programme
titles for selection and said control row data defines said
control information.

3.    For use in a system as claimed in Claim 1 or Claim 2, a
video cassette recorder equipped with its own teletext decoder as
well as the normal receiving circuits.

4.    For use in a system as claimed in Claim 1 or Claim 2, a
teletext television receiver and a video cassette recorder
together with a control interface.

5.    For use in a system as claimed in Claim 1 or Claim 2,
teletext transmission means for producing said necessary control
information.

6.    A system for video cassette recorder programming
substantially as hereinbefore described with reference to the
accompanying drawings.